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Results of the AHRQ Emergency Pharmacist Outcomes Study

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- Co-Investigators: C. Davis, E Rueckmann
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Objectives

1. Briefly review evidence supporting an emergency pharmacist role.
2. Report findings from the Emergency Pharmacist Research Project.



Previous literature

- Inpatient Pharmacists reduce adverse drug event rates
 - 99% of Pharm recommendations accepted by physicians in ICU
 - 66% decrease in ADEs in ICU

Foll H, Poole RL, Bentz WE, Russo JC. Pediatrics. 1987;79(5).
Gatto WH, Whellan DJ. Arch Intern Med. 1992;152(16):1339-45.
Kane SL, Weber RJ, Davis JF. Int Care Med. 2002;29(5):691-6.
Lespe LL, Cullen DJ, Clapp MD et al. JAMA. 1999;282(3):267-70.



Background

- University of Rochester Emergency Department
 - EPh Program Since 2000
 - Accredited EPh residency
 - Anecdotally we found
 - Medication adverse events reduced
 - Staff consult the EPh often
 - Staff seem to value EPh input



Fairbanks RJ, Hays DP, Webster DF et al. Clinical Pharmacy Service in an Emergency Department. Am J of Health-Syst Pharm. 2004; 61(9): 934-7.



Role of the EPh

- Clinical consultation- primary role
 - Nurses, physicians
 - Physical presence
 - Portable phones
- Critical patients, Traumas, Resuscitations
- Order screening- as able, high yield
- Education- patients, nurses, physicians
 - Very well received among providers



Study Objectives

- Add second EPh position (2005)
- Primary Objectives:
 - Optimize role for patient safety (2005)
 - Study outcomes: ADE/PADE/Qual (2005-7)
 - Develop tools
- Secondary objectives
 - Report staff perceptions (2006)
 - Report EM residency program use (2007)
 - Study Barriers (2007)



Optimized Role Study

- Objective
 - Optimize Role *for patient safety*
- Methods
 - Qualitative: interviews (purposive sampling)
 - Emergency physicians, residents, nurses, inpatient providers, pharmacists, patients
 - How can we maximize the patient safety role...
 - Field notes transcribed, coded, sorted
 - Analysis for emerging themes
 - Redundancy → 43 Interviews



Optimized Role: Results

- High visibility / easy access
 - On duty/off duty signs
 - Portable phone
 - Frequent walk-rounds
- Patient centered roles only
 - Minimal dispensing, no stocking
- Focus on ED patients
 - Admitted boarders → inpatient pharmacy



Optimized Role: Results

- Maintain surveillance of provider orders
 - mandatory review of pediatric orders
 - ex) patients <1 year or <10kg
- Respond to critically ill (traumas, codes)
- Focus coverage on peak volume periods
- Minimize administrative responsibility
 - Committees, etc



Roles in other programs

- Survey Study of EM (MD) Residencies:
 - 74% of 135 programs responded
 - 30% had some pharmacy service available in ED
 - Of these, average 8 hours/day
 - 6% had 24/7 coverage

Szczesiul JM, Hildebrand JM, Clark L et al. Use of Clinical Pharmacists in Academic EDs is Limited (abstract). *Academic Emergency Medicine*. 2007;14(5).



EM Residency Survey

- Of those with ED pharmacy services:
 - 49% provide drug or toxicology information
 - 33% screen for drug interactions
 - 30% advise on cost effectiveness
 - 29% dispense medications
 - 19% perform patient counseling
- Of programs performing med rec (51%):
 - Only 12% use pharmacist



Staff Survey Study

ED Staff Value the Clinical Pharmacist

- Surveyed 92 RNs & MDs (82% response)
- 99% say EPh improves quality of care
- 96% say EPh is integral part of the team
- 93% consulted EPh during recent shift
- 93% use EPh more since they stay in ED
- 73% value EPh order screening

Fairbanks RJ, Hildebrand JM, Kolstee KE et al. Medical and nursing staff value and utilize clinical pharmacists in the Emergency Department. *Emergency Medicine Journal*. 2007;24:716-9.



Time-Motion Study

Methods


- Summer 2007
- Medical students shadowed EPh
- Standard time-motion methods
 - Start and end time for each task
 - Nature of task
 - Details of communication (who, what)



Time-Motion Study

Results


- Rounding pattern noted
- Highly utilized (sought after)



Time-Motion Study

What does the Emergency Pharmacist Do?


Tasks	Time in minutes (and % of time)
Order Screening	
Collecting drug/meds	
Preparing and dispensing drug/med	
Returning drug/med	
Patient Education	
Trauma/Code	
Chart review	
Roaming	
Tube sorting/delivery	
Tasks pertaining to research projects	
Researching information	
Email	
Personal	



Time-Motion Study

Who does the Emergency Pharmacist talk to?

Communication	Time in minutes (and % of time)
Speaking with attending physician	
Speaking with resident physician	
Speaking with midlevel provider	
Speaking with nurse	
Speaking with Pharmacist	
Other	



Time-Motion Study

Who does the Emergency Pharmacist talk to?

Reason	Time in minutes (and % of time)
Dosage question	
Drug/med choice	
Question about mode of administration	
Drug/med availability	
Drug/med compatibility	
Side effects	
Discussion pertaining to research projects	
Education/teaching	
Other	



Impact Evaluation Study

- Hypothesis: EPh improves medication safety and quality of care
- Study Design:
 - Prospective enrollment
 - Random selection for chart review
 - 85% of all critically ill
 - 20% of all pediatric (<19yo)
 - 25% of all geriatric (>64yo)
 - 2 groups: EPh absent vs. EPh Present



Definitions

- Adverse Drug Event (ADE)
 - A preventable or non-preventable injury resulting from medical intervention related to a drug.
Bates, Cullen, Laird et al. JAMA. 1995;274(1)
- Potential ADE (PADE)
 - An incident that could have but didn't cause injury due to intervention, chance, or special circumstances
- Problem Drug Order
 - drug order which would have minimal potential for injury if carried out



Impact Evaluation Study

- Outcome Measures
 - ADE, PADE
 - Quality measures: list developed
 - Specific to Emergency Medicine
 - Literature review & expert consensus
- Methods
 - HMPS methods (thanks to David Bates, Diane Seger)
 - Data abstracted- nurse reviewers
 - Suspicion for ADE/PADE identified by RNs
 - Confirmed and classified by MDs

Brennan, Leape, Laird et al. NEJM. 1991; 324(6).



Study: Evaluate the impact

- Quality Indicators
 - CMS
 - Joint Commission Core Measures
 - AHRQ Patient Safety Indicators
 - ACOVE Quality Indicators for elderly
 - RAND Quality Indicators
 - American Heart Association (ACLS, PALS)
 - National Quality Forum
 - American Hospital Association
 - Leapfrog Group
 - Other disease specific quality indicators



Quality Indicators

- AMI
 - ASA on arrival
 - BBL on arrival
 - Thrombolytics within 30 minutes
 - Cath within 60 minutes
- CAP
 - Oxygen saturation assessed
 - Blood Cx prior to ABX (if drawn)
 - Antibiotic within four hours of arrival



Quality Indicators

- Operative Patients
 - Received abx within one hour prior to incision
 - Antibiotic selection appropriate for condition
- Pain/sedation
 - Adequate treatment
 - Timely treatment
 - Adequate sedation in paralysis
 - Adequate sedation for procedures (sync, etc)



Quality Indicators

- Medication selection
 - Appropriate & timely abx
- Time intervals
 - Time to RSI
 - Time to OR or ICU
- ACLS/PALS
 - Compliance with algorithms



Quality Indicators

- Older Adult Measures--Beers and ACOVE
 - Avoid drugs with strong anticholinergic properties whenever possible (if alternatives exist)
 - Use PPI for patient with GI Bleed or ulcer
 - Avoid beta-blocker in patients with asthma
 - Use acetaminophen as first line for osteoarthritis (vs NSAIDS)

Fick DM, Cooper JW, Wade WE et al. Updating the Beers criteria for potentially inappropriate medication use in older adults. Arch Intern Med. 2003; 271:6-24.
Beers MH. Explicit Criteria for Determining Potentially Inappropriate Medication Use by the Elderly: An Update. Arch Intern Med. 1997;157:1531-6.



Impact Evaluation: Results

- Results
 - Total enrollment: 10,224
 - Pediatrics (<19) 5098
 - (Peds Critical: 144)
 - Geriatrics (>64): 2873
 - (Geriatric Critical: 819)
 - Critical: 3245
 - (2252 are not pediatric or geriatric)
 - One missing age



Most commonly given meds

- Results TBA




Most common ade/pade rates

- Results TBA




Impact Evaluation: Results

- Results
- Eph Impact on:
 - Adverse Drug Events
 - Potential Adverse Drug Events
 - Problem Drug Orders
 - Medication Errors
 - Quality Measures




PADE

Population	with EPs	without EPs	p value
Peds			
Geriatric			
Critically ill			
TOTAL			



Med Error

Population	with EPs	without EPs	p value
Peds			
Geriatric			
Critically ill			
TOTAL			



ADE

Population	with EPs	without EPs	p value
Peds			
Geriatric			
Critically ill			
TOTAL			



Impact Evaluation: Results

- [Quality Measures]
- Rate:
 - With EPh _____
 - Without EPh _____
 - P = _____



Impact Evaluation: Results

- [Quality Measures]
- Rate:
 - With EPh _____
 - Without EPh _____
 - P = _____



Impact Evaluation: Results

- [Quality Measures]
- Rate:
 - With EPh _____
 - Without EPh _____
 - P = _____



Impact Evaluation Study

- Limitations
 - One Emergency Department
 - Contamination between 2 groups
 - Staff memory/education
 - Patients who's stay extends between 2 groups



Help for new programs

- Resources Available: Toolkit
 - Convincing others of the need
 - List of References
 - Key manuscripts and abstracts
 - Summary PowerPoint presentations
 - Designing a new program
 - Job description
 - Role and responsibilities
 - Key manuscripts and abstracts



Help for new programs

- A tour of the website
- Link to: www.EmergencyPharmacist.org



What's next?

- Future Research
 - Further Evaluation of the EPh database
 - Evaluation in smaller, non-academic EDs
 - Head-to-head: central screening vs. EPh
 - The use of telemedicine: Remote EPh?



Summary

- The need
- Optimized role
- The evidence
- Increasing participation
- Resources available
 - www.EmergencyPharmacist.org



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---QUESTIONS?---

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